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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/707,366	12/09/2003	Kenneth Boyd	81092490FGT1889	1365

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Dickinson Wright PLLC
38525 Woodward Avenue
Suite 2000
Bloomfield Hills, MI 48304

EXAMINER	
JONES, HUGH M	

ART UNIT	PAPER NUMBER
2128	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/707,366	BOYD ET AL.	
	Examiner	Art Unit	
	Hugh Jones	2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 January 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/9/2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-20 of U.S. Application 10/707,366 filed 12/9/2003 are pending.

Claim Interpretation

2. Some claims call for a "controller". However, in so far as the claims are directed to a computer simulation, it is unclear what is being "controlled" other than the simulation itself. The claims are so interpreted.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sharp et al., "Optimal Preview Car Steering Control," published in Vehicle System Dynamics, Volume 35, no. ICTAM, in 2001, in view of Peng et al., "Optimal Preview Control for Vehicle Lateral Guidance" California Partners for Advanced Transit and Highways 1991.

6. Sharp discloses a simulation system for simulating an operation of an automotive vehicle comprising:

1. A simulation system for simulating operation of an automotive vehicle, said simulation system comprising:
an input device for providing vehicle information (page 2 section 2) and path information (page 4 section 3);
a controller coupled to said input device and operable to simulate said automotive vehicle using a vehicle computer model wherein said controller is programmed to determine a rear side slip angle (pg. 3, fig. 2) of said vehicle computer model (page 1 last paragraph lines 8-11; page 5 figure 3; angle of curvature of road *is proportional to slip angle*); determine an initial steering wheel angle that is input to said vehicle computer model (page 6 first full paragraph, *when k=1*);
when said rear side slip angle is determined to be greater than a predetermined threshold, determine a look ahead scale factor and an initial look ahead point (page 4 section 3 second paragraph, *y.sub.rh;* page 10, *second full paragraph, taught as setting a preview time based on the curvature of the path which is proportional to the slip angle;* (P: page 9 equation 17) and increase the distance of a look ahead point substantially on or near an intended vehicle path as a function of said look ahead scale factor (page 5 figure 3, *taught as computing the road angle which corresponds to the slip angle*; page 10, *second full paragraph, taught as setting a preview time based on the curvature of the path which is proportional to slip angle*);
determine a new steering wheel angle, which is input to said vehicle computer model at a time later than said initial steering wheel angle, by comparing said intended vehicle path with said look ahead point on or near said intended vehicle path (page 10, *second full paragraph, taught as using the preview time in order to determine the preview point ahead of the car; taught as "using the perceived path error to steer the 'correct' way"*);
operate said vehicle computer model with said initial steering wheel angle or said new steering wheel angle (page 5 last paragraph-page 6 first paragraph, *taught as using the system with the steering wheel angle input*); and
generate an output in response to said vehicle computer model and said initial steering wheel angle or first said new steering wheel angle (page 5 figure 4, *taught as the error being based on the steering wheel angle input).*

Sharp does not disclose expressly the path information comprising a road radius of curvature, or the look ahead scale factor being a function of the intended path radius of curvature which is proportional to slip angle. Peng discloses a method controlling a vehicle using an optimal preview control algorithm. Peng teaches the input having path information containing a radius of curvature (**page 6 last paragraph**). Peng further teaches determining a look ahead scale factor as a function of the intended path radius of curvature (**page 9 equation 17**, *taught as*

a function of w, which is disclosed in page 6 last paragraph as the inverse of the radius of curvature).

It would have been obvious to one of ordinary skill in the art of steering control, at the time of the present invention, to modify Sharp's method of determining a look ahead scale factor with Peng's use of the radius of curvature. The motivation for doing so would have been to reduce error in calculating preview data by taking into consideration changes in road curvature (Peng page 5 first two paragraphs).

2. A simulation system as recited in claim 1, wherein said predetermined threshold is about 15 degrees (engineering design choice).

3. A simulation system as recited in claim 1, wherein said controller is programmed to determine both a longitudinal vehicle velocity and a lateral vehicle velocity and also determine said rear side slip angle as a function of said longitudinal vehicle velocity and said lateral vehicle velocity (pg. 3, fig. 2; inherent – par. 29, spec) .

4. A simulation system as recited in claim 1, wherein said controller is programmed to determine said look ahead scale factor as a function of said rear side slip angle (page 10 last paragraph, taught as high oscillation requiring higher preview times).

5. A simulation system as recited in claim 1, wherein said controller is programmed to determine said look ahead scale factor as a function of an exponential of said rear side slip angle (design choice; page 10 second full paragraph, *taught as the scale factor being 1.5 at high speeds or 1, which is 2/3 of the maximum of 1.5, at low speeds; arbitrary use of exponential function*).

6. A simulation system as recited in claim 1, wherein said controller is programmed to determine said look ahead scale factor as a function of an exponential of a product of said rear side slip angle and a constant (design choice; page 10 second full paragraph, *taught as the scale factor being 1.5 at high speeds or 1, which is 2/3 of the maximum of 1.5, at low speeds*).

7. A simulation system as recited in claim 6, wherein said constant is about 0.02 (design choice; page 10 second full paragraph, *taught as the scale factor being 1.5 at high speeds or 1, which is 2/3 of the maximum of 1.5, at low speeds*).

8.(Currently Amended) A simulation system as recited in claim 1, wherein when said rear side slip angle is determined to not be greater than said predetermined threshold, said controller is alternatively programmed to determine an unscaled look ahead factor (design choice – essentially traveling in a straight line, therefore look-ahead is not critical; (page 6 last paragraph – page 7 first paragraph, *taught as when q1 and q2 are low, which keeps the vehicle on target, the steer angle is maintained*).

9. A simulation system as recited in claim 1, wherein said controller is programmed to determine said new steering wheel angle when said vehicle computer model is determined to not be headed on target, and said target is associated with said intended vehicle path (page 10, second full paragraph, *taught as "using the perceived path error to steer the 'correct' way"*);.

Claims 10-18 are similarly rejected.

19. A method of operating a vehicle computer model having vehicle information and path information therein, said method comprising the steps of: determining a rear side slip angle (pg. 3, fig. 2) of said vehicle computer model (page 1 last paragraph lines 8-11; page 5 figure 3; angle of curvature of road *is proportional to slip angle*); determine an initial steering wheel angle that is input to said vehicle computer model (page 6 first full paragraph, *when k=1*);; determining an initial steering wheel angle that is input to said vehicle computer model (page 6 first full paragraph, *when k=1*);
determining a look ahead point that is substantially on or near an intended vehicle path for said vehicle computer model (page 5 figure 3, *taught as computing the road angle which corresponds to the slip angle*; page 10, *second full paragraph, taught as setting a preview time based on the curvature of the path which is proportional to slip angle*);
when said rear side slip angle is determined to be greater than a predetermined threshold, determining a look ahead scale factor and increasing the distance of said look ahead point as a function of said look ahead scale factor (page 10, *second full paragraph, taught as using the preview time in order to determine the preview point ahead of the car*);
when said rear side slip angle is alternatively determined to be less than said predetermined threshold, maintaining the distance of said look ahead point (page 6 last paragraph – page 7 first paragraph, *taught as when q1 and q2 are low, which keeps the vehicle on target, the steer angle is maintained*);
when said vehicle computer model is determined to be headed off a predetermined target, determining a new steering wheel angle, which is input to said vehicle computer model -by comparing said intended vehicle path with said look ahead point on or near said intended vehicle path (page 10, second full paragraph, *taught as "using the perceived path error to steer the 'correct' way"*);
operating said vehicle computer model with said initial steering wheel angle or said new steering wheel angle input (page 5 last paragraph-page 6 first paragraph, *taught as using the system with the steering wheel angle input*); and
generating an output in response to said vehicle computer model and said initial steering wheel angle or said new steering wheel angle (page 5 figure 4, *taught as the error being based on the steering wheel angle input).*

20. A method as recited in claim 19, wherein said look ahead scale factor is determined as a function of an exponential of said rear side slip angle (arbitrary use of the exponential function; page 10, *second full paragraph, taught as setting a preview time based on the curvature of the path, which is proportional to slip angle*).

Response to Arguments

7. Applicant's arguments filed 1/22/2008 have been fully considered.

8. The amendment to the specification is entered.

9. The 112-2 rejections are traversed.

10. Applicant's arguments with respect to the prior art have been considered but are moot in view of the new ground(s) of rejection.

11. Any inquiry concerning this communication or earlier communications from the examiner should be:

directed to: Hugh Jones telephone number (571) 272-3781,

Monday-Thursday 0830 to 0700 ET,

or

the examiner's supervisor, Kamini Shah, telephone number (571) 272-2279.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist, telephone number (703) 305-3900.

mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 308-9051 (for formal communications intended for entry)

or (703) 308-1396 (for informal or draft communications, please label *PROPOSED* or *DRAFT*).

/Hugh Jones/

Primary Examiner, Art Unit 2128

May 8, 2008